

Claims

1. A DNA molecule that can be transcribed to provide an RNA molecule having an untranslated region that provides an increased efficiency of translation of a polypeptide when operably linked to a region encoding said polypeptide; wherein said DNA molecule

- (i) does not encode a mammalian Hsp70;  
(ii) does not comprise an hsp promoter; and  
10 (iii) comprises

a) the sequence:

5'ataacggctagcctgaggagctgctgacagtcactaccttttcgagagtgactcccggtgtcccaaggcttccc  
agagcgaacctgtgaggctgcaggcaccggcgctcgagttccggcggtccggaaggaccgagctcttctcgagg  
15 atccagtgtccggttccagcccccaatctcagagccgagccgacagagagcagggaaccgc-3',

b) the complement of the sequence given in a), or

c) a sequence having substantial sequence identity with a sequence as defined  
20 in a) or b) above.

2. A DNA molecule according to claim 1; wherein said untranslated region is a 5' untranslated region.

25 3. A DNA molecule according to claim 1 or 2 wherein said untranslated region has a  $\Delta G$  of below -10 kCal/mol.

4. A DNA molecule according to any preceding claim wherein said sequence has a  $\Delta G$  that is below -30 kCal/mol.

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5. A DNA molecule according to any preceding claim wherein said sequence has a  $\Delta G$  that is below -40 kCal/Mol.

6. A DNA molecule according to any preceding claim wherein said untranslated region has a  $\Delta G$  of below -50 kCal/Mol.

7. A DNA molecule according to any preceding claim wherein expression of said polypeptide is heat shock responsive.

8. An RNA molecule obtainable by transcribing a DNA molecule according to any of claims 1 to 7.

9. A vector comprising a DNA molecule according to any of claims 1 to 7.

10. An expression system comprising a DNA molecule according to any of claims 1 to 7 or a vector according to claim 9.

11. An expression system according to claim 10 which comprises one or more cells.

12. An expression system according to claim 11 comprising one or more eukaryotic cells.

13. An expression system according to claim 11 comprising one or more mammalian cells.

14. An expression system according to claim 11 comprising one or more human cells.

15. An expression system according to claim 10 which is a cell free expression system.

5 16. A method of obtaining a polypeptide comprising expressing the polypeptide using an expression system according to any of claims 10 to 15 and, optionally, purifying the polypeptide.

17. A method according to claim 16 comprising the step of providing the expression system with a heat shock.

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18. A method of treating a deficiency in the expression of a polypeptide, comprising providing a patient with a DNA molecule as claimed in any of claims 1 to 7 which encodes said polypeptide, a vector as claimed in claim 9 comprising said DNA molecule, or a cell comprising said DNA molecule or vector.

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19. A method of treating a deficiency in the expression of a polypeptide, comprising providing a patient with a DNA molecule as claimed in any one of claims 1 to 7 wherein said molecule is provided in a manner to allow it to become operably linked with a sequence already present in the patient which encodes said polypeptide.

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20. A method of treating a disorder (e.g. an infection) treatable by providing an increased immune response, comprising providing a patient with a vaccine comprising a DNA molecule as claimed in any of claims 1 to 7 or a vector as claimed in claim 9.

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21. A method according to claim 18 or 19; wherein a DNA molecule or vector is provided under conditions allowing it to integrate within the patient's genome.

22. A method according to claim 18; wherein a cell is provided under conditions allowing it to be maintained within the patient.

23. A method according to claim 22 wherein said cell is a cell that has been removed from the patient and has been modified prior to being reintroduced to the patient.

24. A method of treating a deficiency in the expression of a polypeptide, comprising providing the patient with an RNA molecule as claimed in claim 8.

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25. A pharmaceutically acceptable composition comprising a DNA molecule according to any of claims 1 to 7, an RNA molecule according to claim 8, or a cell as described in any of claims 11 to 14.

26. A vaccine comprising a DNA molecule according to any of claims 1 to 5, or a vector according to claim 9.

27. The use of a DNA molecule according to any of claims 1 to 7, of an RNA molecule according to claim 8, of a vector according to claim 9, or of an expression system according to any of claims 10 to 15, in achieving increased expression of a polypeptide.

28. A DNA molecule according to any one of claims 1 to 7 for use in therapy.

29. A DNA molecule according to claim 28 for use in therapeutic or prophylactic vaccination.

30. A DNA molecule according to claim 28 or 29 when administered by particle bombardment.

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32. ~~Method of therapeutic or prophylactic vaccination comprising administering an~~  
~~5 effective amount of a DNA molecule as claimed in any one of claims 1 to 7.~~

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